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Facilities Management Letter

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To: Directors, Managers, Team Leaders - Facilities Management
General Managers, Managers, Team Leaders - Operations
Training

Abstract These Outside Plant Engineering Guidelines are being issued to outline strategies necessary for the deployment of our network and to supercede the previously issued guidelines.

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OUTSIDE PLANT ENGINEERING GUIDELINES

1.0 GENERAL

1.1 Purpose

This document provides updated Outside Plant Engineering Guidelines for immediate use throughout Bell Atlantic. It is intended that this document:

1. Assist you in making appropriate technology choices and economic decisions which impact the expenditure of capital and expense dollars.

2. Support timely and reliable service provisioning for all of our customers and ensure that they are treated in the same professional manner that they require, demand and deserve.

3. Provide direction to assist you in planning and designing the Outside Plant Network for the new digital services that customers are demanding.

1.2 Rationale

Reasons why it has become necessary to provide updated guidelines at this time are as follows:

1. A major shift in our marketing strategy has occurred. Instead of competing to deliver broadband video services, there is a greater immediate marketing opportunity in providing high speed data services to Internet Access providers, Intranetworks which are internal corporate wide networks protected from public access by external firewalls, and Local Area Networks.

2. Successful completion of the Bell Atlantic / NYNEX Merger has resulted in the need to standardize Outside Plant Engineering Guidelines across the new Bell Atlantic.

1.3 Overview

1. The Network is segmented into geographic entities identified as Central Office (CO) or Wire Centers areas. The Outside Plant (OSP) within these areas is further segmented into Feeder Routes and Distribution Areas (DAs). The purpose of this segmentation is to establish manageable entities that can be administered and relieved with the appropriate technology economically and efficiently.

2. Segmentation of OSP into geographic areas and the placement of the technologies discussed in this document are required to accomplish the efficient conversion from an analog to a digital network to meet customer service demands.

3. This document is sectionalized into specific categories to assist in identifying particular facets of the complicated tasks associated with the Outside Plant Engineering functions. These tasks can be generally classified as those associated with planned facility relief, those required to meet customer service requests and those needed to meet service

specific facility requirements. Other sections of this document are provided for informational purposes.

4. These guidelines assist in managing the facilities and positioning the Outside Plant Network for the future. Engineering judgment and local conditions such as budget availability and capital restrictions, Right of Way (ROW), local government restrictions, growth, plant conditions and all other related items are part of the decision making process.

1.4 Work Groups

1. This document is directed to Facilities Management Centers (FMCs) and Design Build Teams (DBTs) and Network Facilities Planning (NFP). The FMCs and DBTs perform the design functions and NFP performs the planning functions associated with Outside Plant Engineering.

2. The Outside Plant Capital Management and Estimate Review organization will utilize these guidelines in their estimate review process. All alternative solutions that were studied and the rationale for the decisions made for the job selected must be documented with supporting data in the estimate package submitted for approval to this group.

3. Secondary users are all other personnel involved with the construction, assignment, installation, and maintenance of loop facilities.

1.5 Acknowledgments

The input of all BA personnel is greatly appreciated. In particular, we thank the sub-team leaders whose participation was and is invaluable to the production of these guidelines. They are as follows:

Chuck Garbett- General
Dave Hammett- Service Provisioning
Ted Spencer- CO Equipment and Fiber Loop Rings
Carl Peters- Feeder Routes
Kathy Brodecki- Distribution Areas
Debbie Gardner- Switch Engineering

1.6 Summary

Several key points in these guidelines are summarized below and bolded in the document. *Refer to the page number noted after each item for additional details and information.*

1. The trigger for the planner to analyze and provide a solution for non-interfaced plant is when that section of the feeder route will reach 85% fill within the next twelve months. Interfaced plant should be analyzed for a solution when it will reach 90% fill within the next twelve months. Refer to page 9.

2. All relief jobs must be developed with the objectives of providing an all fiber feeder network, reducing the copper cable length to the customer and meeting all customer service requirements. Refer to page 10.

3. Breaking multiples is a priority due to the service problems caused by bridged tap on digital services. Refer to page 10.

4. Working facility rearrangements are not recommended, but may be utilized in certain circumstances to defer Capital expenditures for the CO switch or OSP facilities. Refer to page 10.

5. All efforts must be made to properly focus the placement of copper cable and Digital Subscriber Line (DSL) loop electronic systems until fiber cable fed loop electronic systems can be deployed to meet customer requirements. Refer to page 12.

6. A fiber cable based transport network capable of delivering broadband services remains the long term service objective. Refer to page 13.

7. The relief period for the hardware, shelves and/or channel banks and common plug-ins is 3 years. Terminate facilities, so that at the end of 3 years the fill level will be 90%. Refer to page 16.

8. The Channel Units that are required to provision all non-designed voice grade type services should be placed to accommodate six months growth in most cases. If an area has volatile growth that can not be determined, then equip for twelve months and document the rationale for your decision in the estimate package. Refer to page 16.

9. Fiber fed loop electronic systems are the first choice to provide additional facilities for relief when new cable facilities are required. Refer to page 17.

10. The Bell Atlantic mission is to provide service to our customers in the time frame that they require it to meet their specific needs. Refer to page 24.

11. Only utilize spare existing conditioned copper T-1 technology to provision DS-1 services as a last resort. Where conditioned copper facilities are at exhaust, never place new apparatus cases or design new T-1 spans. Refer to page 25.

12. Avoid mixed administration of feeder and distribution facilities to any terminal. Never feed a Serving Area Interface (SAI) with distribution facilities. Refer to page 35.

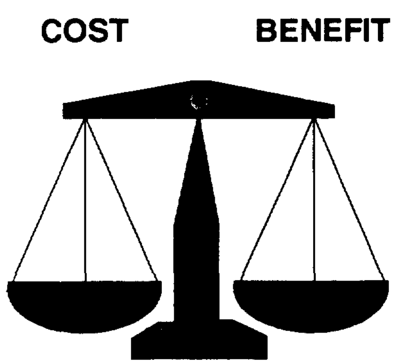
13. SAI design is the choice for feeder to distribution interfacing because it handles growth and churn with a maximum of flexibility and a minimum of work force activity. Refer to page 35.

14. Detailed analysis is required for any Distribution Area (DA) that ranks high in LATIS to decide if the high cost is a single or recurring event. Work with the maintenance group(s) to determine the problem and solution. Refer to page 35.

15. Feeder to distribution ratios as well as distribution pairs per living unit will take into account existing living units, ultimate living units, undeveloped land areas, ultimate land usage, and business requirements. Refer to page 36.

16. Place larger SAIs to serve an area as opposed to establishing many smaller SAIs to serve the same area. Refer to page 37.

17. Documentation demonstrating the rationale for copper replacements will be required in the estimate package. Refer to page 39.



2.0 FEEDER ROUTES

The purpose of Feeder Administration is to manage the feeder facilities by performing the following major tasks:

- Feeder Route Monitoring
- Identifying Feeder Relief Requirements
- Evaluating Feeder Relief Alternatives

- Selecting Feeder Relief Technology

2.1 Feeder Route Monitoring

1. Detailed feeder route planning must be accomplished in order to ensure that adequate feeder facilities are available to accommodate customer service requirements. Route relief must be judged on the feeder network itself and provided upon the achievement of critical fill defined as the ratio of the sum of working, Connect-Throughs (CTs), reserved and defective pairs to the total number of pairs allocated to that route. Critical exhaust sections must be anticipated and must be relieved once critical fill levels are recognized. The fill at relief should be defined and routinely measured against the growth forecast.

2. In addition to fill levels, other important considerations when determining relief requirements are current funding budget levels, growth forecast, market gain and loss forecast. Actual growth requirements are exceeding forecast rates for additional lines creating facility shortages in areas that were not scheduled for relief. This is requiring us to reallocate and redirect resources to meet this demand.

3. Health of the Network measurements such as the number of Inward Service Orders generating a Request for Manual Assistance - Unable to Assign a Complete Loop (RMA - UACL) and other facility modifications contained in Loop Activity Tracking Information System (LATIS) and in Loop Analysis Report Tracking (LART) such as Line and Station Transfers (LSTs), Clear Defective Pairs (CDPs), Break Connect Through (BCT), and Wired Out of Limits (WOL) can be used as indicators of facility shortages. The Loop Activity Data (LAD) module allows engineers to generate flexible reports that can be used to rank Tracking Units (TUs) or cable complements by the number of facility modifications reported. The Loop Facility and Assignment Control System (LFACS) database continues to be a major resource to indicate facility modification activity. The target objectives will be defined in the Area Network Plan.

4. Taper coding is the standard, required method to identify critical cross-sections of OSP for route monitoring purposes. Taper coding is essential for the proper use of EZ PLAN and Planners Workbench, LATIS, the Loop Engineering Assignment Database (LEAD), and LART. It should be initiated in those areas where it does not exist and maintained in those areas where it is now being administered.

5. Buffer zones must be established by the FMC/DBT for all Serving Area interfaces (SAIs) and for all building terminals sized at 100 feeder pairs or more. The buffer zone is sized based on growth rate and time required to implement relief. Buffer zones should be designed and administered such that relief is provided when the buffer zone threshold is first exceeded.

6. The Data Validation and Reporting (DaVaR) process is a mechanized process that should be used to recover facilities lost due to record error prior to the placement of new facilities. It can assist with the synchronization of the records between Loop Maintenance Operation System (LMOS), LFACS, and SWITCH (not an acronym).

7. The Telecommunications Act of 1996 opened the local exchange market to other Competitive Local Exchange Carriers (CLECs) and requires us to allow nondiscriminatory unbundled access to network elements at any technically feasible point in the network. One of the specified network elements is the local loop, the facility between the Main Distribution Frame (MDF) in the CO and the Rate Demarcation Point (RDP) or Network Interface Device (NID) at the customer premises loop. CLECs may use the existing feeder and distribution facilities for their unbundled requirements. Refer to FP-G-97-016.

8. Basic Rate Integrated Services Digital Network (ISDN) can not be counted on to provide spare facilities in the local loop. Studies have shown that customers generally keep their existing service and supplement it with ISDN.

2.2 Identifying Feeder Relief Requirements

1. Determine the critical exhaust date of the route. **The trigger for the planner to analyze and provide a solution for non-interfaced plant is when that section of the feeder route will reach 85% fill within the next twelve months. Interfaced plant should be analyzed for a solution when it will reach 90% fill within the next twelve months.** Possible outcomes of this analysis are no work required at this time, Facility Rearrangements or New Facilities required.

2. Facility relief must be provided prior to the critical exhaust date which is defined as that point in time when the current facilities available can no longer support the service demand in a given route. The relief should be provided prior to incurring expenses that result from rearrangement and clear defective pair activities.

2.3 Evaluating Feeder Relief Alternatives

1. The cost of rearrangements could justify relief jobs. Compare the costs to perform the rearrangements with the cost to provide new facilities.

2. Relief jobs should favor the expenditure of Capital over Expense and minimize throws and step throws in the Network. Every engineer has the responsibility and is empowered to maximize capital (C) and removal (X) expenditures, and minimize rearrangement and repair

(M and R) accounts. In this way, we maximize the return on our investment while improving the quality of service to our customers.

3. **All relief jobs must be developed with the objectives of providing an all fiber feeder network, reducing the copper cable length to the customer and meeting all customer service requirements.** These considerations are part of the decision making process.

2.31 Feeder Facility Rearrangements

1. Spare facility rearrangements to break multiples or to maximize copper utilization by allocating or reallocating them to areas where they are needed is an option. **Breaking multiples is a priority due to the service problems caused by bridged tap on digital services.** Half tapping of copper pairs has the same affect on the digital signal.

2. **Working facility rearrangements are not recommended, but may be utilized in certain circumstances to defer Capital expenditures for the CO switch or OSP facilities.** Feeder relief may be accomplished by throwing or rewiring copper fed circuits to Pair Gain (PG) pairs and using these spare copper facilities at a different location along the route. If this alternative is selected to defer the addition of an Analog Line Unit in the CO, then ensure that there is a relief benefit to the OSP as well. If it is done to provide OSP relief, there should be a documented plan on how these spare copper pairs will be utilized. If a throw or rewire is the correct solution, complements with few to no special services should be chosen.

3. It is especially important to avoid multiple rearrangements that disturb customer service, complicate the Network and databases as well as creating less than adequate productivity of our work force. The goal is to engineer jobs in which simplicity is a major design feature.

2.32 New Feeder Facilities

1. New facilities are provided by copper cable, fiber cable and loop electronics additions. Both copper and fiber cables provide feeder facilities, and copper provides for distribution facilities.

2. Minimize future investment in copper cable and maximize the use of fiber cable fed loop electronics systems due to the benefits it has over services provisioned via copper cable. These advantages include greater bandwidth to provide higher speed digital services, lower maintenance costs and remote operations monitoring and control capabilities.

3. Consideration should be given to placing the new facility at the point of demand.

3.0 COPPER DEPLOYMENT

All efforts must be made to properly focus the placement of copper cable and Digital Subscriber Line (DSL) loop electronic systems until fiber cable fed loop electronic systems can be deployed to meet customer requirements.

1. Copper cable will play a diminishing role in the Network in the future. Its life expectancy is dependent on many variables such as service offerings, market requirements, powering arrangements, and rehabilitation strategies.

2. There are facility requirements and applications in the network where the use of fiber cable is not yet economical or practical. The placement of new copper feeder cable is a viable alternative for certain situations.

3. If no structure restrictions exist such as there is spare conduit or spare space on the pole line, then copper cable placement could be the appropriate solution. Consider structure limitations when sizing the copper cable as placing too small a cable could force future structure additions.

4. The placement of properly sized copper feeder cable may be required to extend bulk unallocated pairs that are otherwise stranded into another feeder administration area. Fully utilize existing uncommitted spare pairs to provide relief and break multiples.

5. Copper cable fed routes should be relieved to accommodate a minimum of a three year growth period. All copper feeder relief jobs must display the required sizing documentation including known demand, historical growth data and structure limitations.

4.0 FIBER DEPLOYMENT

We have been placing fiber fed electronic systems in the network for 20 years. They were first deployed as an Interoffice Facility (IOF), then in the loop as a feeder facility and now in some distribution facility applications. As the cost to deploy fiber fed electronic systems decreases, its use is more economical for applications with less access lines or fewer high speed digital service requirements and within shorter distances from the CO. **A fiber cable based transport network capable of delivering broadband services remains the long term service objective.**

1. The Loss Budget for a fiber span must be calculated to ensure the span loss does not exceed the power level of the Optical Line Unit (OLU). Included in this calculation are the sum of the losses of the fiber cable, splices, connectors, and fiber jumpers.

2. Buffer tube and ribbon integrity should be maintained for both diverse and non-diverse point to point applications as well as ring applications. Diversely protected services should be separated from all non-protected services by maintaining buffer tube/ribbon integrity.

3. Network Facilities Planning is responsible for assignment, monitoring and utilization of fiber cable and capacity.

4. Analyze relief requirements before the last four fibers in a route are assigned.

5. Do not place large point-to-point fiber cables for unknown future requirements. Every route should not require a maximum size fiber cable throughout.

6. All requirements for fiber cable sizing must be considered and supporting documentation must be included in the estimate package. The sizing of new fiber cables must be based on the following criteria:

- Known growth, existing and potential requirements for DS-1, DS-3 and OC-3c services
- Video requirements such as Distance Learning
- IOF requirements
- Multi-mode fiber replacements
- Existing and planned Rings
- Route Diversity
- Route 1x1 fiber protection on diverse facilities where possible and practical
- Alternate and dual serving wire center requirements
- Requirements for regulatory initiatives such as Chapter 30 (PA), Senate Bill 115 (DE), New York Service Improvement (SI) and Advantage New Jersey (NJ)
- Structure limitations such as conduit or pole congestion, river crossings or limited access to the cable
- Total number of existing and planned RT sites, fiber nodes and CSA's along the route
- Number of customer premises multiplexers and optical DS-2 systems

5.0 LOOP ELECTRONICS SYSTEMS

A Request For Proposal (RFP) was distributed to a variety of prospective Optical Digital Loop Carrier (ODLC) / Next Generation DLC (NGDLC) product suppliers in February, 1998. The results of this RFP are to be determined later this year and may change the products available for selection. A separate document will be distributed identifying the appropriate product to use in specific situations. Until this document is issued, continue to use the equipment you are currently deploying.

1. Loop electronic systems emulate the Central Office (CO) such that the services provisioned via the derived copper cables begin with a zero (0) decibel (dB) design loss at the RT. The copper cables leaving the RT site are identified as feeder facilities that typically terminate in a Serving Area Interface (SAI) at each DA. The copper cables that leave the SAI and extend into the DA to terminals at customer locations are designated as distribution facilities.

2. Carrier Serving Areas (CSAs) economically cluster loop electronics systems fed via a digital signal at a location in the field to provide feeder facilities for DAs.

3. Position the RT inside the CSA at a location that minimizes the copper cables length leaving the RT site to the customer premises. The CO has the capability to function as a RT. Consider a strategy to establish the area surrounding the CO as a CSA. These strategies will allow us to provide high speed digital services to more customers in the near future.

4. If there are existing fiber or copper cables with spare capacity, analyze the cost differential between the placement of loop electronic systems on the spare copper pairs or fibers for additional facility requirements as opposed to placing new fiber or copper cables.

5. Where a fiber fed multiplexer exists, perform a cost analysis to determine if a higher speed multiplexer is economically justified to provide for additional facility requirements instead of placing new cable.

6. Perform a cost analysis for areas close to the CO to determine if it is economical to place a fiber fed loop electronics system. Consider locating the RT site within a customer premises location and obtain an easement that allows us to serve other areas from this location. Review out-of-hours access, powering requirements and any unique factors associated with a customer premises location.

7. Spare Pair Gain (PG) pairs are considered available whether they are equipped with channel units or connected to vacant slots.

8. The years of relief provided by a loop electronics solution will vary depending on the growth rate and technology used. **The relief period for the hardware, shelves and/or channel**

banks and common plug-ins is 3 years. Terminate facilities, so that at the end of 3 years the fill level will be 90%.

9. **The Channel Units that are required to provision all non-designed voice grade type services should be placed to accommodate six months growth in most cases. If an area has volatile growth that can not be determined, then equip for twelve months and document the rationale for your decision in the estimate package.** Equip with Channel Units required for rearrangements associated with system cut-over in addition to those required for growth.

10. Reserve slots for designed special services because channel units required will be placed by other departments on a service order basis.

11. The capability for Mechanized Loop Testing (MLT) must be provided for every RT installation.

5.1 Universal Digital Loop Carrier

1. The Universal Digital Loop Carrier (UDLC) arrangement consists of the COT located in the CO and the RT located in the Outside Plant or customers premises.

2. The COT and the RT channel units perform analog to digital conversions to allow the feeding facility to be digital.

3. UDLC is deployed where the types of services to be provided by the system cannot be integrated such as non-switched services and unbundled loops.

4. UDLC is used in areas that have unknown service requirements to ensure that facilities are available to provide for services that customers may request.

5.2 Integrated Digital Loop Carrier

1. The Integrated Digital Loop Carrier (IDLC) arrangement eliminates the need for channel units in the CO to accomplish the analog to digital conversion. The IDLC interfaces with a Local Digital Switch (LDS) by direct electrical connection at the DS-1 rate. This connection is accomplished by terminating the digital line in the LDS instead of the COT.

2. IDLC is the preferred design choice over the wholesale use of UDLC. Integration provides overall economic advantages.

3. No RT site should be entirely integrated. The ratio of IDLC to UDLC is RT site dependent and based on the requirement for services that can not be integrated and those that can be

integrated as well as the availability of Analog Line Units (ALUs) and/or Digital Line Units (DLUs) in the CO.

4. Any integration plan should consider traffic load which is identified as Hundred Call Seconds (CCS). Consult the local Network Administration Center (NAC) to review CCS loading (Switch) balance factors. CCS intensive service offerings will require the involvement of Switch Planning and Capacity Management, in addition to the NAC.

5. It is necessary to determine if sufficient ALUs exist for UDLC systems and/or if sufficient DLUs exist for IDLC systems. An agreement defining which type of line unit interface will be used must be achieved during the planning stage. If required, additional equipment will need to be ordered.

5.3 Optical Digital Loop Carrier / Next Generation Digital Loop Carrier

1. **Fiber fed loop electronic systems are the first choice to provide additional facilities for relief when new cable facilities are required.** These systems include Optical Digital Loop Carrier / Next Generation Digital Loop Carrier (ODLC/NGDLC), Synchronous Optical NETwork (SONET) multiplexers and DLC.

2. Where the ODLC/NGDLC supplier offers multiple remote and dual feeder remote options, they should be deployed to maximize the utilization of the COT. Ensure that "round the clock" access is available for any sites considered for multiple remote sites to facilitate trouble analysis and/or clearing of downstream or upstream sites. Dual feeder and multiple configurations require additional software key(s), the cost of which must be considered during the economic analysis.

3. Consideration must be given to reserving, and/or designating bay space adjacent to the ODLC/NGDLC, since future placement of banks have product specific cable footage requirements and limitations (i.e., 15 feet from Common Control Assemblies, high density fiber bank, additional universal channel banks, etc.) for system growth and expansion.

5.4 Digital Loop Carrier

1. Bell Atlantic has approved the PG-Flex system to overcome the local power and installation time limitations associated with the smaller DLC systems throughout the region. The PG-Flex is a line powered, copper fed utilizing High capacity Digital Subscriber Line (HDSL) technology, 24 line pair gain device. The PG-Flex operates as a UDLC system. Two pairs are used for power and signaling and one pair is required for MLT testing. Installation time is estimated at 2-3 days. Refer to the PG Flex approval document, NP-PS-98-001, and the Outside Plant deployment guideline document, 1998-00221-OSP.

2. SLC-96 spare channel unit capacity in working systems should be fully utilized. Do not purchase or deploy new SLC-96 systems or "clones". Remove and retire working SLC-96 systems when the opportunity presents itself.

3. SLC Series 5 should be utilized when required by Federal Government contract or when a RT has existing wired bays, there is multiplexer capacity to support it and COTs are installed. Do not mix SLC-96 and SLC Series 5 in the same bay due to alarm wiring incompatibilities. Refer to NX-PL95-06-10-005 for guidelines in the North.

4. Embedded first generation COTs should be utilized to achieve maximum fill. Vacant SLC-96 and Series 5 channel slots should be used to capacity.

5. In digital wire centers, when first generation universal COTs become spare, they should be removed and retired (a minimum of one bay per removal). In non-digital offices, use or reuse should also be on a last resort only basis.

6.0 SELECTING FEEDER RELIEF STRATEGIES

The following are some **examples** for service requirements and possible solutions:

Scenario 1

CSA 20 KF from CO

Existing Facilities

- Area fed via SLC5 system (192 pairs)
- 164 pairs working, 4 defective pairs, and 5 CTs

Current fill: 90%

Forecast Requirements: 1 line per year

Analysis: Spares are adequate for several more years.

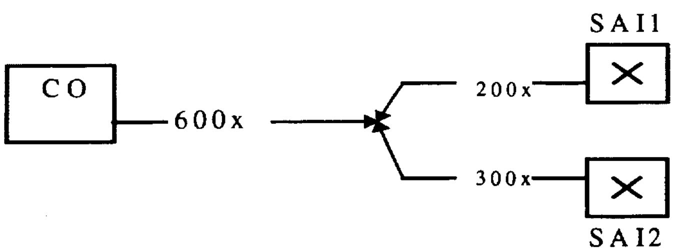
Result: No work required.

Scenario 2

Allocation Area (AA) 8KF from the CO

Existing Facilities

- 500 pairs currently feed two SAIs,
- 200 pairs feed SAI 1, 300 pairs feed SAI 2,
- 25 pairs multipled between each SAI, 20 assigned in SAI 1, 5 assigned in SAI 2
- Current fill: 80% in SAI 1, 95% in SAI 2
- 100 spare uncommitted pairs in route



Forecast Requirements: 1 line per year in SAI 1 and 4 lines per year in SAI 2

Solution: Break the 25 pair count which is multipled between SAI 1 and SAI 2 and advance 25 spare unallocated pairs into SAI 2 on the 25 pair multipled count.

Result: 5 spare pairs gained in SAI 1 and 20 spare pairs gained in SAI 2.

Note: In the absence of a multiple to break, the correct job would be to advance spares into SAI 2 on spare binding posts.

Scenario 3

SAI 13 KF from the CO

Existing facilities:

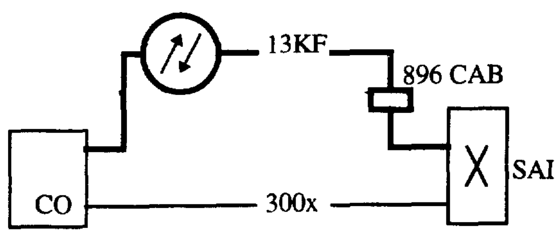
- 300 copper pairs, 220 working, 20 defective, 10 CTs, and 5 reserved
- 0 uncommitted spares in route
- Fill: 85%

Forecast requirements:

- 30 DS-0s per year
- 3 DS-1s in year 1, 1 DS-1 in year 2, and 1 DS-1 in year 3

Solution:

- Place Litespan 2000 896 cabinet for all new growth
- Place hardware for 3 years growth, plug-ins for 6 months growth



Note:

Discuss with the Network Administration Center to determine possible rewires of copper circuits onto Pair Gain pairs which depends on the ALU and DLU capacity in the switch.

7.0 REASON FOR JOB AND DESCRIPTION OF JOB

The following is a sample Reason For Job and Description Of Job that may be used to prepare the narrative for the estimate package which is required in all Estimate Work Order authorizations:

REASON FOR JOB

7.1 Why the job is being done?

This job is being done to provide feeder relief in the west route of the Main Street CO. The overall fill of this route is 97%. The annual growth for the route is 215 lines. The proposed RT will provide 900 PGL pairs for the route. The new fill will be 81% when this job is completed. Three years of growth is being provided for in the route. Based on current forecasts, at the end of three years the fill in the route will be 90%. This authorization will provide channel units for 104 pairs which will care for six months growth for this section of the feeder route.

7.2 Why is it being done now?

The critical exhaust date has been reached since there are only 52 spare pairs left. This is insufficient to accommodate the growth rate in this route. Based on the current fill levels for DAs 3102, 3103, 3105, 3106A, 3106B, 3106C, 3110, 3111 and 3113, relief is required as detailed below. EZ Plan was used to establish relief criteria and timing of the relief.

7.3 Why is it being done this way?

1. With the forecasted growth spread throughout the route, placing one PSI 2016 walk-in cabinet with LS2000 and advancing 900 PGL pairs into SAIs is the best cost solution for this route. DAVAR and defective pair clearing was used in an attempt to delay this job.

2. DA 3102 & 3103 – No relief required.

3. DA3105 – SAI P2 Grove Av. (650 pairs available, 575 assigned, 50 defective, 25 spare). This interface is currently at 96% fill. Advance PGL48, 1-200 into this interface for growth. Equip 24 pairs of this count for six months growth. The new fill will be 74%. The annual growth is 40 lines per year. The fill will be 88% at the end of three years.

4. DA 3106A - SAI 157C (650 pairs available, 558 assigned, 89 defective, 3 spare) This interface is currently at 99.5% fill. Advance PGL48, 201-350 into this interface for growth. Equip 16 pairs of this count for 12 months growth due to volatile demand history. The new fill will be 81%. The annual growth is 15 lines. The fill will be 87% at the end of three years.

5. DA 3106B - SAI 137C (500 pairs available, 377 assigned, 102 defective, 21 spare). This interface is currently at 96% fill. Advance PGL48, 351-550 into this interface. Equip 24

pairs for six months growth. The new fill will be 68%. The annual growth is 50 lines. The fill will be 90% at the end of three years.

6. DA 3106C - SAI 5717A (550 pairs available, 426 assigned, 121 defective, 3 spare). This interface is currently at 99.5% fill. Advance universal PGL (PGL48, 551-900) pairs to this interface. Universal pairs are required because the interface feeds a business park. Equip 40 pairs for six months growth. The new fill will be 61%. The annual growth is 75 lines. The fill will be 86% at the end of three years.

7. DA 3110, DA 3111, DA 3113 – No relief required.

DESCRIPTION OF JOB

7.4 What equipment is being placed and what work is being done?

1. Install one LS2000 COT equipped with five channel banks. Reserve adjacent bay space for extension bay. Place one PSI 2016 LS walk-in cabinet at 5541 Parliament Drive equipped with a five channel bank LS2000 system. A new CSA 3105 will be established for this RT.

2. A 24 fiber cable will be placed from the hand hole west of the RT for a distance of 650 feet. Use one of the vacant conduits from the hand hole. The conduit will have to be broken into at some point near the RT.

3. A 2100 pair copper cable with count including PGL48, 1-1125 will be placed a distance of 75 feet from the RT to a splice in front of the RT. Pairs not advanced into the SAIs at this time will be available at this splice for future or unanticipated service demand requirements. The 2700 pair cable in that splice feeds the four interfaces that will comprise the new CSA.

4. No. of fibers to be placed: 24 Fiber Count for RT: CC30202, 25-36

8.0 SERVICE PROVISIONING

1. **The Bell Atlantic mission is to provide service to our customers in the time frame that they require it to meet their specific needs.** We must accomplish this task in the most economical manner utilizing technology that is compatible with our network while positioning it for high speed digital service requirements.

2. While the provisioning of DS1, DS3, VT1.5, STS1, STS3, OC3, OC3c, OC12, OC12c and other services such as BRI ISDN and ADSL consume a large amount of the planners and designers time, they also generate a significant amount of revenue for Bell Atlantic.

3. DS-3 services are to be extended to the customer's premises. This requirement is not dependent on individual States RDP policies. These services would include DS3, STS1, STS3, OC3, OC3c, OC12, OC12c and some of the rates for RADSL, but not BRI ISDN.

4. ODLC/NGDLC is a viable service option for providing DS-1 circuits. For locations where DS-3 or significant DS-1 demand is recognized, utilize a multiplexer for the DS-3 and DS-1 services the ODLC/NGDLC for the DS-0 services only.

5. Bell Atlantic provides wholesale exchange services to Resellers who in turn provide retail services to the end user. Alternate Service Providers offer competitive services to the end user. Examples of these Bell Atlantic competitors and/or customers and the services they provide are as follows:

   - Cable Television (CATV) provides high speed data services via Cable Modems, Traditional/Internet Telephony and Digital TV.

   - Competitive Local Exchange Carriers (CLECs) provide telephony and data services using its network where available and reselling the BA network where necessary.

   - Interexchange Carriers (IEC) provide local service using alternative networks such as Teleport and MFS/WorldCom and resold BA access lines to complement its existing long distance, data and usage services.

   - Others providers are Internet Service Providers (ISPs), Internet Telephony Providers and Wireless Providers such as Winstar.

Emerging competitive issues that would impact these guidelines will be addressed in a future document.

8.1 T-1 Technology

1. T-1 carrier has the greatest potential for interfering with other technologies for new services and is last choice for providing DS1 service to customers.

2. **Only utilize spare existing conditioned copper T-1 technology to provision DS-1 services as a last resort. Where conditioned copper facilities are at exhaust, never place new apparatus cases or design new T-1 spans.** The elimination of existing T-1 carrier spans should be an incentive for fiber placement.

3. If copper T-1 Carrier technology is used to provision the DS-1 service to the customer premise, one maintenance spare per RDP should be provided to ensure expedient service restoration in the local loop. Restrict the placement of new apparatus cases to maintenance situations only.

8.2 Digital Subscriber Line Technology

1. Utilize Digital Subscriber Line (DSL) technology products to meet customer service demands via existing copper cable facilities. This technology allows us to meet Service Order due dates which satisfies our customers needs today, but it does not position our network for the future requirements of our customers.

2. DSL requires non-loaded copper cable to operate correctly. It is very efficient when utilized on loops less than 18 KF which are already non-loaded. DSL creates administrative difficulties when used on existing loaded facilities that requires the removal of load coils prior to its use.

3. DSL technology supports Digital Single Subscriber Carrier (DSSC) systems without a repeater and Integrated Services Digital Network (ISDN) both with and without a repeater. High capacity DSL (HDSL) technology supports DS-1 services and a copper cable fed DS-1 loop electronic system.

4. Consider Digital Single Subscriber Carrier (DSSC) applications as a temporary solution for second line growth at the same address to meet service requirements. This may also be a cost effective alternative to replacing buried service wire and/or digging up encapsulated splices to provide an additional line. Refer to BA 917-100-936.

5. A maintenance spare is not provided for DS-1 circuits over HDSL including those requiring a doubler.

6. HDSL should be used in those situations where fiber cable fed loop electronics is not immediately available and/or cannot be installed within the time constraints required by the customer's due date.

8.3 Fiber Fed Multiplexers

1. The deployment of SONET and DS-1 fiber extension multiplexers should conform to the Bell Atlantic standard one-to-one protection.

2. When service is provided on fiber to a customer premises using a DS-1 fiber extension multiplexer, spares do not need to be provided for maintenance purposes since protection is available on the low speed side.

8.4 Conversion from Copper to Fiber

1. Where it is possible and economical to provision a new DS-1 service request over fiber rather than existing copper conditioned facilities, it should be done since it is very difficult to obtain a turndown of the copper circuit at a later date to rollover to fiber.

2. DS-1 rollovers from copper to fiber would be economically justified and could be initiated where the quality of customer service is compromised due to significant trouble history, when there is inadequate space availability in the main telephone room for additional equipment to be installed, if a copper DS-1 is out of service and a fiber fed multiplexer with spare capacity is available at that location, or where market demand dictates.

9.0 FIBER LOOP RINGS

Synchronous Optical NETwork (SONET) technology is considered a standard loop architecture in Bell Atlantic. It is used to deliver SONET based services and other high capacity circuits to the customer.